

## Claims

### 1-46. (cancelled)

47. (new) An instrument for measuring a Raman signal of tissue, the instrument comprising a laser, a signal detection unit for measuring the Raman signal, and a fiber optic probe, wherein the fiber optic probe comprises one or more optical fibers for directing laser light onto the tissue and for collecting light that is scattered by the tissue and guiding the collected light away from the tissue towards the signal detection unit, the fiber or fibers comprising a core, a cladding and optionally a coating, and the fiber or fibers for collecting light having substantially no Raman signal in one or more parts of the 2500-3700 cm-1 spectral region, and wherein the detection unit records the Raman signal scattered by the tissue in said spectral region, the instrument further comprising a signal analysis unit which analyses the recorded Raman signal in one or more parts of the 2500-3700 cm-1 spectral region, the analysis comprising an algorithm which outputs data regarding the molecular composition of the tissue and/or the clinical diagnostic class to which the tissue belongs.

48. (new) Instrument according to claim 47, wherein the fiber optic probe comprises an optical fiber that both directs laser light onto the tissue and collects light that is scattered by the tissue and guides the collected light away from the tissue towards the signal detection unit.

49. (new) Instrument according to claim 47, wherein the fiber optic probe comprises at least one fiber having a low OH- fused silica core.

50. (new) Instrument according to claim 47, wherein the fiber optic probe comprises at least one optical fiber having a fused silica core and a fused silica or Teflon or TECS cladding.

51. (new) Instrument according to claim 47, by using a coating material in which intrinsically little or substantially no signal is generated in the 2500-3700 cm<sup>-1</sup> wavenumber interval.

52. (new) Instrument according to claim 47, wherein the detection unit also comprises a detector for measuring fluorescence and/or a detector for near-infrared absorption.

53. (new) Instrument according to claim 52 wherein fluorescence and/or near-infrared absorption measurements make use of a fiber also used in obtaining Raman signal and wherein the detection unit also comprises a detector for measuring fluorescence and/or a detector for near-infrared absorption.

54. (new) Instrument according to claim 47 wherein the fiber optic probe comprises a bundle of fibers for measuring and/or scanning a tissue area.

55. (new) Instrument according to claim 47, wherein part of the fiber is integrated or combined with a catheter that provides additional information about the tissue or which comprises means to obtain tissue samples, means to treat tissue and/or means used in surgical procedures.

56. (new) Instrument according to claim 47, wherein the fiber optic probe comprises one single optical fiber.

57. (new) Method of using of an instrument for measuring a Raman signal of tissue, the instrument comprising a laser, a signal detection unit for measuring the Raman signal, and a fiber optic probe, wherein the fiber optic probe comprises one or more optical fibers for directing laser light onto the tissue and for collecting light that is scattered by the tissue and guiding the collected light away from the tissue towards the signal detection unit, the fiber or fibers comprising a core, a cladding and optionally a coating, and the fiber or fibers for collecting light having substantially no Raman signal

in one or more parts of the 2500-3700 cm<sup>-1</sup> spectral region, and wherein the detection unit records the Raman signal scattered by the tissue in said spectral region, the instrument further comprising a signal analysis unit which analyses the recorded Raman signal in one or more parts of the 2500-3700 cm<sup>-1</sup> spectral region, the analysis comprising an algorithm which outputs data regarding the molecular composition of the tissue and/or the clinical diagnostic class to which the tissue belongs.

58. (new) Method of using according to claim 57, wherein the tissue is excised, biopsied or taken from a human or animal body before measuring.

59. (new) Method of using according to claim 57, for measuring a Raman signal of a tissue sample prior to it being resected, or biopsied or for selecting tissue for biopsy or resection.

60. (new) A method for producing and measuring a Raman signal of tissue, comprising providing a laser, a detection unit for measuring a Raman signal, and a fiber optic probe, wherein the fiber optic probe comprises one or more optical fibers for directing laser light onto the tissue and for collecting light that is scattered by the tissue and guiding the collected light away from the tissue toward the signal detection unit, the fiber or fibers comprising a core, a cladding and optionally a coating, sending laser light through the one or more optical fibers, receiving the Raman signal from the tissue through the one or more optical fibers and detecting the Raman signal by a signal detection unit, the fiber or fibers for collecting light having substantially no Raman signal in one or more parts of the 2500-3700 cm<sup>-1</sup> spectral region, and wherein the signal detection unit records the Raman signal in said spectral region, the instrument further comprising a signal analysis unit which analyses the recorded Raman signal in one or more parts of the 2500-3700 cm<sup>-1</sup> spectral region, the analysis comprising an algorithm which outputs data regarding the molecular composition of the tissue and/or the clinical diagnostic class to which the tissue belongs.

61. (new) Method for evaluating an optical fiber for measuring a Raman signal of tissue, wherein an instrument according to claim 1 is used and wherein a tissue sample is excised, biopsied or taken from a human or animal body before measuring, and wherein the Raman signal of the optical fiber is measured of the sample and of a blanc, and wherein the Raman signals of the sample and of the blanc are compared.

62. (new) Method for evaluating the suitability of a type of fiber for measuring the Raman signal of tissue, comprising:

- using an instrument according to one of claims 47
- performing a measurement without tissue being present at the distal end of the fiber,
- performing a measurement with tissue being present at the distal end of the fiber,
- comparing the spectra obtained with and without tissue being present
- concluding that the fiber is suitable for measuring the Raman signal of tissue.